THAT WHICH IS CLAIMED IS:

1. An apparatus for dispensing dry powders, comprising:

an elongate flow channel having a width, length, and depth, the flow channel having axially spaced apart inlet and outlet ports, wherein the elongate flow channel is configured to extend in an angular orientation of between about 10-75 degrees relative to the axial direction of flow;

a flexible piezoelectric layer configured to overlie the flow channel so that, in operation, the piezoelectric layer is able to flex upwardly away from the lowermost portion of the underlying flow channel; and

a signal generator operatively associated with the piezoelectric layer, wherein, in operation, the signal generator is configured to output a signal for flexing the piezoelectric layer in the elongate flow channel.

2. An apparatus according to Claim 1, wherein the flexible piezoelectric layer is a piezoelectric polymer, copolymer or derivative thereof.

3. An apparatus according to Claim 2, wherein the piezoelectric layer is a metallized PVDF layer having a thickness that is less than about 100 microns.

4. An apparatus according to Claim 3, wherein the piezoelectric layer is less than about 50 microns thick.

5. An apparatus according to Claim 4, wherein the piezoelectric layer is about 28 microns thick.

6. An apparatus according to Claim 3, further comprising positive and ground signal paths extending between the piezoelectric layer and the signal generator, wherein the piezoelectric layer has opposing upper and lower primary surfaces, and wherein, in operation the signal generator is electrically connected to the piezoelectric layer so that the ground is attached to the upper surface and the positive electrical connection is attached to the lower surface.

7. An apparatus according to Claim 1, further comprising a quantity of dry powder disposed in the apparatus, wherein the piezoelectric layer has opposing upper and lower primary surfaces, and wherein, in operation, the piezoelectric layer upper primary surface is configured to reside above the lowermost portion of the flow channel to contact the dry powder, and wherein, in operation, flexing the piezoelectric layer vibrates the dry powder to facilitate the flow of dry powder flow through the flow channel.

8. An apparatus according to Claim 1, further comprising a cover member configured to align with and attach to an upper portion of the flow channel member, the cover member having an axially-extending, inwardly-facing tip portion that is configured to enter the flow channel and reside above the piezoelectric layer and the lowermost portion of the flow channel to define a flow orifice that extends between the piezoelectric layer and the tip portion of the cover member.

9. An apparatus according to Claim 8, wherein the piezoelectric layer has an associated outer perimeter portion and a center portion, and wherein the outer perimeter portion is held captured by the attached cover and flow channel members while the center portion is free to move upward and downward in the flow channel.

10. An apparatus according to Claim 1, wherein, in operation, the signal generator transmits a signal having a carrier frequency of between about 2500-7800 Hz to the piezoelectric layer.

11. An apparatus according to Claim 1, wherein the flow channel is configured with opposing declining sidewalls.

12. An apparatus according to Claim 11, wherein the flow channel has sidewalls that converge to a common center when viewed in cross-section.

13. An apparatus according to Claim 1, further comprising an angular adjustment mechanism attached to the flow channel member that is adapted to orient the flow channel to extend at desired selectively adjustable angles.

14. An apparatus according to Claim 13, further comprising a hinge frame member pivotally attached to said flow channel member.

15. An apparatus according to Claim 1, wherein the flow channel depth decreases in the direction of flow.

16. An apparatus according to Claim 15, wherein the flow channel depth varies substantially linearly along its length.

17. An apparatus according to Claim 8, wherein the flow orifice decreases in size along the length of the flow channel.

18. An apparatus according to Claim 17, wherein the flow orifice decreases from about 7 mm to about 3 mm.

19. An apparatus according to Claim 18, wherein the cover member tip portion is configured to vary in its projection depth, and wherein the cover member is configured to be adjustably positioned over the flow channel member so that the cover member cooperates with the flow channel member to provide an adjustable size flow orifice and outlet port.

20. An apparatus according to Claim 19, wherein the flow channel has opposing sidewalls that symmetrically decline, and wherein the cover tip portion has sides that symmetrically decline, the tip portion declining substantially parallel to the flow channel member sidewalls.

21. An apparatus according to Claim 20, wherein the cover member tip portion sides converge to a lowermost common planar center portion.

22. An apparatus according to Claim 21, further comprising an upstanding hopper that is in fluid communication with the input port of the flow channel.

23. An apparatus according to Claim 1, wherein the apparatus is configured to dispense low density dry powder at a flow rate that is repeatable within about +/- 10%, batch to batch.

24. An apparatus according to Claim 1, wherein the apparatus is configured to dispense different dry powders each having different flow rates between about 0.001-30 mg/sec.

25. An apparatus according to Claim 24, wherein the apparatus dispenses dry powder at about 0.028 mg/sec.

26. An apparatus according to Claim 24, wherein the apparatus dispenses dry powder at about 3.360 mg/sec.

27. An apparatus according to Claim 1, wherein the apparatus is configured to evaluate flow characteristics of a target dry powder.

28. An apparatus according to Claim 1, wherein the apparatus is configured to serially receive a pharmaceutical dry powder input amount of between about 2-50 mg.

29. An apparatus according to Claim 28, wherein the dispensing flow is controlled by decoupling or terminating transmission of the signal from the signal generator to the piezoelectric layer.

30. An apparatus according to Claim 1, further comprising an amplifier operatively associated with the signal generator to provide an amplitude-modulated, non-linear input signal with a plurality of superpositioned modulation frequencies to the dry powder in the flow channel.

31. A method for selecting and/or determining customizable excitation signals for dispensing dry powders, comprising:

providing an elongate flow channel having a floor of piezoelectric material;

selecting an angle of orientation for the flow channel such that the flow channel angularly extends in a non-vertical, non-horizontal orientation in the axial direction;

providing a quantity of a target dry powder;

outputting a vibration excitation signal having a first carrier frequency from a signal generator to the piezoelectric material;

flowing the dry powder out of the flow channel;

outputting a vibration excitation signal having a second carrier frequency from the signal generator to the piezoelectric material; and

determining the vibration signal for the target dry powder that generates a repeatable and/or uniform fluid-like substantially non-agglomerated flow output.

32. A method according to Claim 31, further comprising adjusting the angle of orientation of the flow channel and determining a desired operational angle of orientation of the flow channel based on the angles used in the selecting and adjusting steps, the determined operational angle being below the static angle of repose of the target dry powder.

33. A method according to Claim 31, further comprising repeating the steps for a second target powder.

34. A method according to Claim 31, wherein the dry powder flow rate is reproducible to have variation that is less than about +/- 10%.

35. A method according to Claim 31, wherein the flow rate is reproducible to have variation that is less than about +/- 5%.

36. A method according to Claim 31, wherein the flow rate is reproducible to have variation that is less than about +/- 2%.

37. A method according to Claim 31, wherein the flow channel is disposed in a structurally rigid flow channel member, further comprising adjusting the size of a flow orifice extending above the piezoelectric material floor and below a cover

member that overlies the floor and rests on the upper portion of the flow channel member by sliding the cover member forward or rearward over the flow channel member.

38. A method according to Claim 32, wherein the determining, altering and selecting steps are carried out by selecting an angle of orientation that is below the static angle of repose of the target dry powder under analysis and evaluating the flow of the dry powder at a plurality of different angles below the static angle of repose.

39. A method according to Claim 31, wherein the flowing step is controllably started and stopped by the application and removal, respectively, of the excitation signal to the piezoelectric material.

40. A method according to Claim 37, wherein the cover member has an elongate, axially-extending tip portion that has a downwardly extending length that varies over the axial length of the cover member to thereby project into the flow channel at different depths.

41. A method of dispensing a dry powder, comprising:

providing an elongate flow channel having a powder support floor formed of a flexible piezoelectric material and inlet and outlet ports;

directing a quantity of dry powder into the inlet port of the elongate flow channel;

vibrating the piezoelectric material with an electric excitation signal so that the piezoelectric material deflects upwardly; and

flowing the dry powder out of the outlet port responsive to the vibrating step.

42. A method according to Claim 41, further comprising adjusting the orientation angle of the elongate floor channel so that the flow channel angularly extends in a non-vertical, non-horizontal configuration and so that the outlet port is lower than the inlet port.

43. A method according to Claim 41, wherein the flowing step is carried out to serially dispense dose amounts of dry pharmaceutical powder(s).

44. A method according to Claim 43, wherein the flowing step is controllably started and stopped by the application and termination, respectively, of the electric excitation signal to the piezoelectric material.

45. A method according to Claim 41, further comprising tensioning the piezoelectric material in the flow channel.

46. A method according to Claim 45, wherein the tensioning step is carried out by securely clasping a portion of the piezoelectric material between a cover member and an underlying flow channel member and allowing the center floor portion of the piezoelectric material in the flow channel to be suspended above the bottom of the flow channel member.

47. A method according to Claim 46, wherein the vibrating step comprises applying the excitation signal voltage to the underside of the piezoelectric material.

48. A method according to Claim 41, wherein the excitation signal has a plurality of superpositioned modulating frequencies.

49. A method according to Claim 48, wherein the number of superpositioned modulating frequencies is at least three.

50. A method according to Claim 49, wherein the number of superpositioned modulating frequencies is four.

51. A method according to Claim 50, wherein the four modulating frequencies are in the range of between about 10-15Hz.